CLAIMS

1. A system for controlling the torsional stability of the drivetrain (2) of a machine, in particular of a helicopter (H), said system (1) making it possible to regulate the speed of at least one engine (5) of said drivetrain (2) and comprising at least:

- a first means (7) for acting on said speed, as a function of operating commands;
- a second means (8) for measuring a speed NTL corresponding to the speed of rotation of the free turbine of said engine (5);
- a correction device (9) for correcting said measured speed NTL into a corrected value NTLcorr;
- a third means (11) for determining a preset value NTLpres corresponding to the preset value for the speed of rotation of the free turbine of the engine (5); and
- a computation unit (12) for automatically computing, on the basis of said preset value NTLpres and of said corrected value NTLcorr, operating commands which are applied automatically to said first means (7),

wherein said correction device (9) implements a correction law which corrects said measured speed NTL to obtain a corrected value NTLcorr exhibiting, at least in a frequency domain situated around at least the first torsional mode of said drivetrain (2), the same modulus as said preset value NTLpres and a phase which is opposite to the phase of said preset value NTLpres in such a way as to damp at least said first torsional mode of the drivetrain (2).

2. The system as claimed in claim 1,

wherein said correction device (9) corrects said measured speed NTL to obtain a corrected value NTLcorr which exhibits the same modulus as said preset value NTLpres and a phase which is opposite to the phase of said preset value NTLpres, in frequency domains

situated around a number n of torsional modes of said drivetrain (2), n being an integer greater than 1.

3. The system as claimed in claim 1, wherein said computation unit (12) and said correction device (9) are incorporated into one and the same computer of digital type.

4. The system as claimed in claim 1, wherein said correction device (9) is an independent computer.

5. The system as claimed in claim 1, wherein said correction device (9) is an at least partially mechanical means.

6. Process for determining the correction law implemented by the correction device (9) of the system (1) specified under claim 1, wherein the following operations are carried out in succession:

a) a simulation model of the power train comprising the drivetrain (2) and at least one engine (5) of the machine (H) is formulated theoretically, making it possible to compute a first transfer function for transferring between the free turbine's speed of rotation, which is filtered with the aid of a predetermined filter, and said preset value NTLpres;

b) the power train is operated while parameters making it possible to tune said first transfer function are measured;

c) an open-loop transfer function is determined by placing the thus-tuned transfer function of the power train and the transfer function of said filter in series;

d) the transfer function of said filter is subtracted from said open-loop transfer function; and

e) a corrector is formulated as replacement for said filter, so as to obtain a correction transfer function which is such that the overall transfer obtained by the placing of the latter function and of the transfer function of the power train in series represents said correction law.

7. The process as claimed in claim 6, wherein an increase in the gains is effected on said correction law.